

IX THE EAR, NOSE, MOUTH, AND THROAT



HORACE GREEN OF VERMONT

The first American physician to specialize in diseases of the throat was Horace Green, whose classic book, *A Treatise on Diseases of the Air Passages*, was published in 1846. Born in 1802 in Chittenden, Vermont, Green was the son of a Revolutionary War veteran whose three brothers died in that war. Green graduated from Castleton Medical College in Vermont in 1824 and undertook an apprenticeship with his brother in Rutland, Vermont, for 6 years. In 1830 he attended two courses of medical lectures at the University of Pennsylvania and then returned to general practice in Vermont.

In 1838, at age 36, Green went to Europe for 5 months to attend lectures and clinics. In London he engaged in a conversation with James Johnson, editor of the *British and Foreign Medical Review*, who inspired Green by remarking that all modes of treating laryngeal disease would fail until proper agents could be applied directly to the membranous lining of the larynx.

On his return in 1838 to the United States, Green took residence in New York City and began 18 exciting years in laryngology, publishing his treatise in 1846 at age 43. He was professor in Castleton Medical College from 1840 to 1843 and professor in New York Medical College from 1850, until his resignation in 1860 at age 59. He was the author of three books and numerous articles and helped found the *American Medical Monthly* in 1854.

Green was the first physician to apply topical medication to the larynx using a probang, and his claim in 1846 caused an international controversy. His method was to soak silver nitrate in a sponge attached to the tip of a 10-inch, curved whale bone, and apply the sponge directly to the larynx. Because so few physicians believed that the larynx could tolerate the presence of a foreign body, Green was accused of fraud. He suffered disrepute for a decade until he dem-

onstrated his technique on patients in 1855 before a committee appointed by the New York Academy of Medicine. In a private autobiography, he described the circumstances:

After my return from my second trip to Europe in 1851, I entered with more spirit than ever into the practice of my "specialty," the employment of local treatment of the air passages. My practice had greatly increased. My patients came from all parts of the world, but with this came also an increase of opposition from my professional brethren. Those who were unfortunate in business or from some other cause were envious of my success. They evinced a very unkind spirit and denied the possibility of my doing what I was doing in my office every day. But I would not quarrel with them, trusting that the truth would ultimately be known, and my word vindicated. For several years now I have heard nothing of this opposition. (Green, 1865)

The following passage from letters by a patient, Julia Robertson Pierpont, who underwent a throat operation, vividly describes the appearance, manner, and practice of Green at his home in Vermont in 1850:

Everything was done to make me comfortable and at home. The house is very large and furnished elegantly—costly paintings and statuary are scattered over the building. It is lighted by gas, and the Croton water, hot and cold, is carried all over it. There are speaking trumpets in the walls, in fact everything elegance or comfort could suggest. Dr. keeps his carriage and I don't know how many servants. We dine by candle light and have lunch at one o'clock. The dinner is a very ceremonious affair, and I get almost tired out before it is over. But I learn a great deal at the table, for the conversation is quite refined and intellectual. Dr. Green is about forty, young looking, handsome, polite, but sometimes absent minded, has traveled in Europe and likes style but not dashing. Dr. Jenkins is Dr. G's junior partner is talented, amiable, kind, polite, witty, and a great talker, but always talks to the point.

Last not least I will tell you about my throat—Dr. Green sent for me to go to the office a few days after I came and looked at my throat. "Bad enough," was his exclamation. "There is a deep ulceration out of sight, your physicians have not discovered it." Said he, "What would you say Miss R. if I should be obliged to cut away some of that bad flesh that is in your way there?" I replied, "Whatever you think best to do I will endeavor to submit to patiently"—"Well then the sooner it is over the better, do you not say so?" I answered, "Yes by all means"—I seated myself and while he prepared his instruments, he said it would soon be over and spoke low and sweetly to me, but he was mistaken in his lady, I needed no coaxing and had determined before hand to make no fuss, if it killed me—so I smiled and said nothing. Dr. Jenkins came behind me, I afterward learned, to hold my hand, but that was unnecessary and he did not touch it. I sat perfectly still, and the Dr. cut off my left tonsil. The blood streamed from my mouth for about half an hour, and then I sat down and had the right one cut off,—after it stopped a little, a sponge application of nitrate of silver was applied and almost strangled me. The bleeding began again and continued until two o'clock—and for a few days I suffered a great deal of pain, but I had kind nursing and "French fixins" to get well on. (Pierpont, 1850)

A laryngoscope was first used by Garcia in Europe in 1855, but Green was largely responsible for advancing its use in the United States. In 1858 he obtained one from Vienna through a New York surgeon, and in the company of his partner, John H. Douglas, later physician to U. S. Grant, Green began to use the instrument in his practice. After his retirement in 1860, Green was deeply affected by the Civil War, for "it was a great trial to him to be unable to do as his forefathers had done—bear arms in his country's defense; and he had no

sons old enough to send to the war" (Francis, 1867). A year after that war ended, he died of tuberculosis at age 66.

—CHARLES STEWART ROBERTS

REFERENCES

- Francis SW. Horace Green, M.D., L.L.D., etc. Med Surg Reporter 1867;16:64–66.
Green H. Autobiography. MSS, New York Academy of Medicine, New York, 1865.
Pierpont JR. Letters. MSS, New York Academy of Medicine, New York, 1850.
Synder C. The investigation of Horace Green. Laryngoscope. 1975;85:2012–22.

Evaluation of the head and neck area involves close attention to details of history and symptoms, intricate physical examination, and proper use of specialty equipment.

History

Begin by asking about the *nose and paranasal sinuses*. The examiner should inquire about the presence and duration of trauma, nosebleeds (Chapter 124), drainage, facial aching, congestion, or previous surgery. The type and severity of trauma, a description of the type of drainage, and the degree of pain or swelling should be carefully noted. Associated congestion in the nose and records of all previous nasal or head and neck surgery should be recorded. Frequent occurrence of colds, hay fever reactions, and seasonal exacerbation of these problems should be recorded. Snoring, the use of intranasal drugs such as cocaine or crack, or prolonged use of nasal sprays and the intake of other decongestant medications should be documented. Frequent redness or swelling of the eyes should be noted also.

Next consider the *oral cavity and salivary glands*. The examiner should inquire about the presence and duration of the following lesions in and about the mouth and lips: ulcers or canker sores, tender gums or painful teeth, xerostomia (dry mouth), fissures at the corner of the mouth or the tongue, and the presence of blood in saliva. The patient should be asked about tongue soreness, recent dental work, difficulty chewing, excess saliva or thick saliva, the chronic use of tobacco, and unusual habits such as bruxism or nocturnal grinding of the teeth. The patient should be asked about the possibility of previous swelling or tenderness under the jaw, in the preauricular area, in the palate or on the tongue, or any limited or painful jaw motions.

For the *jaw and temporomandibular joints*, a history should be taken to document the presence and duration of the following: trauma, braces or orthodontic treatment, clicking or crunching sounds when opening the mouth, preauricular swelling, tenderness to palpation, teeth grinding at night, frequent clenching of teeth during the day, or pain or discomfort into the temple or down the side of the neck. The patient should also be asked about ringing in the ear or tinnitus, associated sensations of dizziness or unsteadiness, and the presence of ear fullness. The use of dentures or bridges should be documented, and the patient's history concerning excision of third molars (wisdom teeth) or other extractions should be documented.

For the *pharynx, larynx, and thyroid gland*, the examiner should inquire about the presence and duration of sore throats and previous antibiotic treatment for pharyngitis or mouth ulcers. Questions should be asked about difficulty swallowing, the presence of gland or node enlargement in

the neck, the presence of hoarseness (Chapter 125), or the presence of blood in the sputum (hemoptysis). Occupational exposures to chemicals, dust, or various gases should be documented. Any known respiratory allergens should be recorded. Tobacco use should be documented, and the number of years of usage recorded. Unusual use of the voice, such as professional singing or talking consistently above a noisy environment, should be noted. The presence of an irritative cough, tenderness or fullness under the collar, or consistent clearing of the throat should be documented. The patient should be asked about pain on neck motion. The regular use of any prescription drugs should be recorded. Because almost one-third of AIDS patients present with head and neck disorders, any history of risk factors for the disease should be investigated (high-risk sexual practices, use of intravenous drugs with shared needles, blood transfusions).

In collecting information about problems involving the *face*, the patient should be asked about discomfort in the cheek or forehead, unusual pains following dental procedures, or unusual sensitivity to sunlight. Inquiries should be made about prolonged occupational exposures to sunlight, chemicals, or dust. Patients should be asked if they have used protective hats or masks when around these substances. Questions about the severity of acne in adolescence or recurrent skin infections should be noted. The patient should be asked about visual disturbances related to sagging eyelid or the presence of any double vision, which indicates obstruction of vision.

For evaluation of the *ears and hearing*, the patient should be asked about awareness of decrease in conversational hearing, and the effect that background noise has upon hearing (Chapter 120). The history of childhood ear disease should be documented along with head, facial, or ear trauma, exposure to ototoxic drugs, previous ear surgery, or ear treatment, and the presence of any severe febrile ear illnesses during childhood. A careful family history for hearing impairment, the use of hearing aids, or known ear surgery should be documented. The patient should be asked about recent respiratory infections or allergy, and medical treatment for severe allergy should be recorded. Questions about ear drainage or discharge, or the presence of excessive wax, should be asked. An occupational and recreational history should be taken, particularly relating to exposure of the patient to excessive noise. The quality, duration, and type of noise should be documented, and the patient's hunting experience or other exposure to gunfire should be recorded. The frequency of aircraft exposure or scuba diving needs to be documented.

Symptoms related to the ear such as ringing in the ear, or tinnitus (Chapter 121), are very common, and specific questions should be asked about duration, intensity, unilateral or bilateral presence, and pulsating or throbbing

quality. Fullness in the ear should be documented, and balance disorders or vertigo require particular elaboration (Chapter 123). Frequent probing of the ear for wax removal or itching, or the placement of foreign bodies in the ear, should be documented. The presence of persistent pain in the ear, or otalgia (Chapter 122), or knowledge about drum perforations in the past, is needed. Questions relating to unusual sensitivity to sudden or loud sounds, particularly those associated with or related to other ear symptoms such as tinnitus, vertigo, fullness, or fluctuant hearing loss, need to be recorded. Intermittent, changing, or fluctuant hearing loss may be present.

Physical Examination

The instruments needed to study the head and neck are listed in Table 119.1. Table 119.2 presents the steps of the examination.

Nose and Paranasal Sinuses

A nasal speculum, a transilluminator on a battery handle, and a sterile swab for culture material are needed for the examination (Figures 119.1 and 119.2). Some clinics have fiberoptic nasopharyngoscopes for examination of the sinus ostia and nasopharynx, and it may be necessary to send the patient for screening sinus x-rays. Sinus examinations should always be done in a darkened area, and the use of a decongestant spray such as oxymetazolin or 0.5% neosynephrine is encouraged.

During examination of the nose (Chapter 128), a careful external inspection should be carried out with notation made of any previous injury, trauma, or congenital deformity. Frontal and maxillary sinuses should be transilluminated, and the speculum should be used to evaluate the intranasal

Table 119.1
Equipment Needed for Head and Neck Examination

Metal or plastic nasal speculum
Curved transilluminator on battery handle
Disposable wooden tongue depressors
Decongestant sprays, such as oxymetazoline or 0.5% neosynephrine
Sterile cotton swabs for culture
Rubber gloves (nonsterile)
Penlight, electric or fiberoptic headlight
No. 5 laryngeal mirror (mirror warmer or hot water)
Standard wax curette (buck curette)
Metal ear syringe or standard 50 cc plastic syringe
Standard plastic emesis basin
Small thin wire applicator with tufts of cotton
Standard electric otoscope with closed lens attachment to permit pneumatic movement of the eardrum with a rubber bulb
Ear speculae of various sizes
Hydrogen peroxide or aqueous zephiran to dissolve wax
256 Hz tuning fork
<i>Ancillary diagnostic equipment</i>
Electric audiometer
Impedance bridge
X-ray equipment to permit routine CT and MRI view of the head and neck area
Fiberoptic nasopharyngoscope

Table 119.2
Sequence of the Head and Neck Examination

Nose and paranasal sinuses
Oral cavity and salivary glands
Jaw and temporomandibular joints
Pharynx, larynx, and thyroid glands
The face
Ears and hearing
1. Inspection of the face, head, ears, and neck for distinctive physical signs. Note unusual speech or hearing responses to questions. Note presence of glasses or hearing aids.
2. Inspection of nasal cavity for secretions and membrane characteristics with nasal speculum. Repeat after decongestant spray.
3. Palpation, percussion, and transillumination of maxillary and frontal sinuses.
4. Inspection of oral cavity and pharynx with light and tongue blade. Palpation of submaxillary and parotid glands (external and binaural with glove). Note condition of teeth or use of dental plates (remove these).
5. Palpation of TM joints, superior and inferior triangles of the neck, carotid pulsation, thyroid gland, and supraclavicular area. Auscultation for carotid bruits.
6. Inspection of facial skin, nose, pinnae, and scalp for crusts, pigmented lesions, ulcerations, cysts, excessive wrinkles, eyelid edema or sagging, and involuntary movements (tic).
7. Inspect ear area for wax or surgical scars. Remove any wax with curette that obstructs clear view of eardrum. Move eardrum with pneumatic otoscope and note light reflex. Perform Weber and Rinne tuning fork tests and record results. Examine for secretions, canal lesions such as bony nodules, eardrum scars or perforations, discoloration or fluid behind the drum, and pulsations. Record the need for louder conversation, repetition of question, or lack of response.

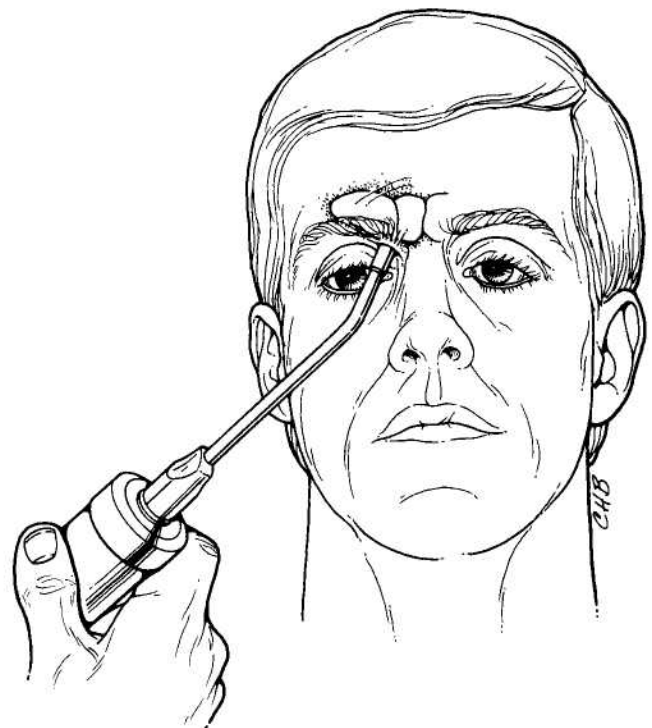


Figure 119.1
Transillumination of frontal sinus. Light is placed under supraorbital rim and transillumination observed through frontal bone.



Figure 119.2
Transillumination of maxillary sinus. The light is placed against the cheek and transillumination observed through the open mouth.

cavity (Figure 119.3). A fiberoptic examination can be carried out along with percussion and palpation over the maxillary and frontal sinuses to denote tenderness.

Oral Cavity and Salivary Glands

Equipment needed includes a penlight or a headlight, disposable tongue blades, a sterile swab for culture, and rubber gloves for palpation (see Figure 119.4). The patient may need to have a CT scan of the salivary glands, which can be extremely helpful in evaluating occult lesions. Examination of this area should include inspection of the palate, tonsillar fossae, gums, tongue, cheeks, teeth, and the openings of the submaxillary and parotid ducts (Chapters 129–131) (Figures 119.5 and 119.6). Careful bimanual palpation of the submaxillary gland (Figure 119.7) with palpation and massage of the parotids (Figure 119.8) with observation for secretion from the ducts should be carried out.

Jaw and Temporomandibular Joints

Equipment needed to evaluate this area of the body consists of disposable tongue blades and the use of x-rays of jaw joints in opened and closed position. Examination involves careful palpation of the jaw joints at rest and in motion (Figure 119.9). The patient should be asked to bite down firmly on a wooden tongue blade to see if this will elicit pain in the joint. Tapping on the teeth with a metal probe may help identify isolated dental disease that is referred to the jaw joint area.

Pharynx, Larynx, and Thyroid Gland

Equipment includes disposable tongue blades, rubber gloves, penlights and headlights, fiberoptic pharyngeal and lar-

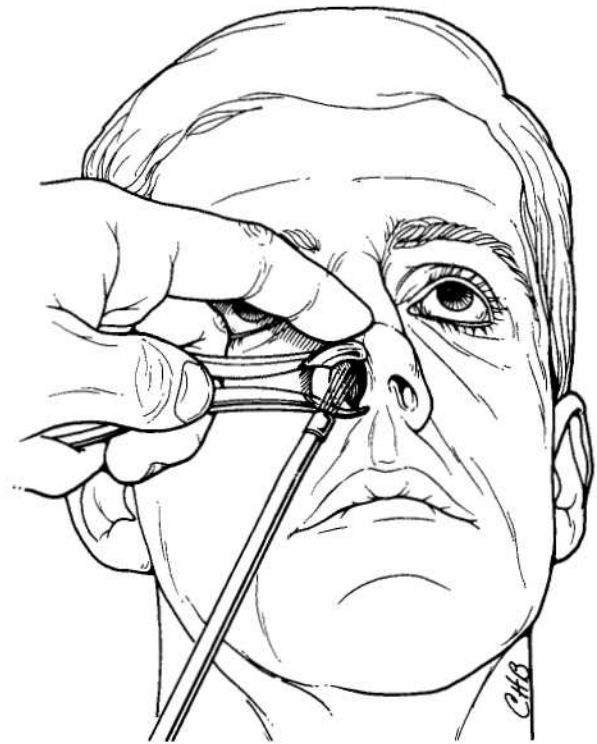


Figure 119.3
Use of nasal speculum to visualize nasal cavity and septum. Exudate or disorders of the septum should be noted.

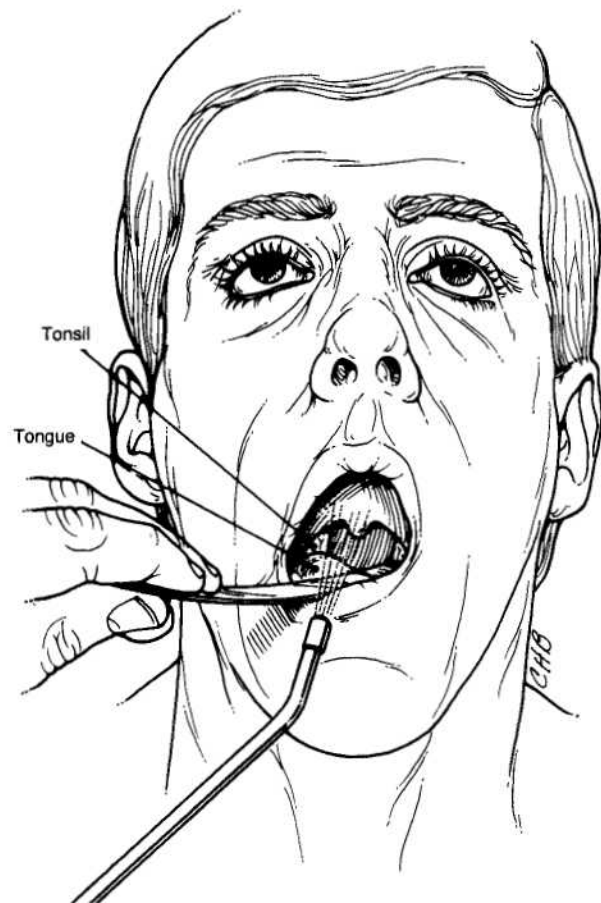


Figure 119.4
Use of tongue blade to suppress one side of tongue base to visualize tonsil area and posterior pharyngeal area.

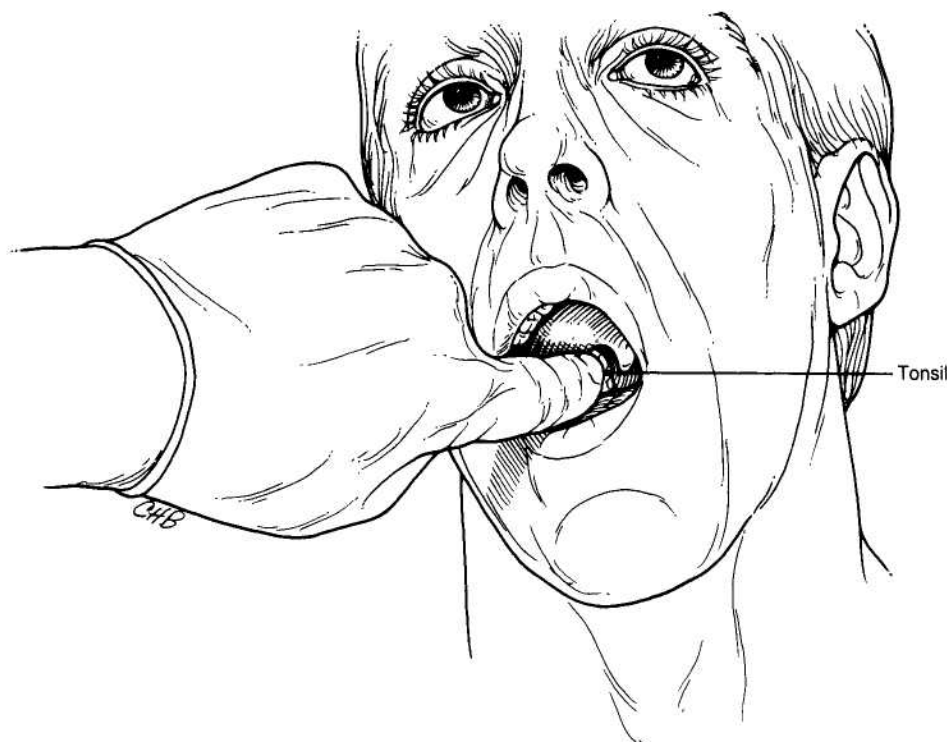


Figure 119.5

Palpation of tonsillar fossa and base of tongue area with gloved hand. Unusual hardness, enlargement, or tenderness is noted.

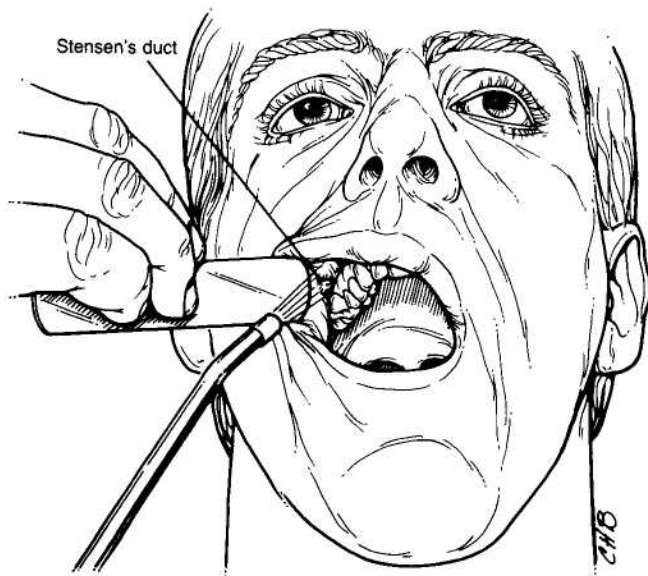


Figure 119.6

Retraction of cheek to show opening of Stensen's Duct opposite the second upper molar.

yngeal scopes, laryngeal mirrors, and sterile culture swabs. X-ray is often utilized to document lesions around the larynx and pharynx, particularly CT scans of the neck. Rubber gloves are used for palpation of the tonsillar fossa and base of the tongue. Further palpation of the thyroid (Figure 119.10), larynx, and hyoid bone should be done (Chapter 132). Mirror or fiberoptic examinations are vital in order to document the motion of the vocal cords and lesions of the epiglottis and larynx.

Face

Careful inspection of the face as a patient talks will reveal many factors. The examiner should look carefully for signs of trauma, previous facial surgery, eye swelling, or "bags under the eye," which might indicate fluid or allergic disorders. The quality of the skin can be quickly noted. The patient should be evaluated in the presence of good lighting (preferably sunlight), and it is often helpful if cosmetic surgery is to be considered to have frontal and profile photographs taken. Examination of the face involves inspection for blepharochalasia (eyelid sagging), excess wrinkling, or redundancy of skin in various areas of the chin, neck, upper neck, and face. Regional inspection of the face should be made to document skin lesions such as keratoses, moles, or scars. Facial asymmetry, nasal distortions, prominent ears, malocclusion (overbite or underbite), or excessive hair should be documented. Enlargement in the sides of the face, which indicates masseter hypertrophy or abnormal facial movements such as tics, should be documented. The patient should have the face palpated for tenderness or protrusions, and



Figure 119.7
Bimanual palpation of submaxillary gland and contents of submaxillary triangle.

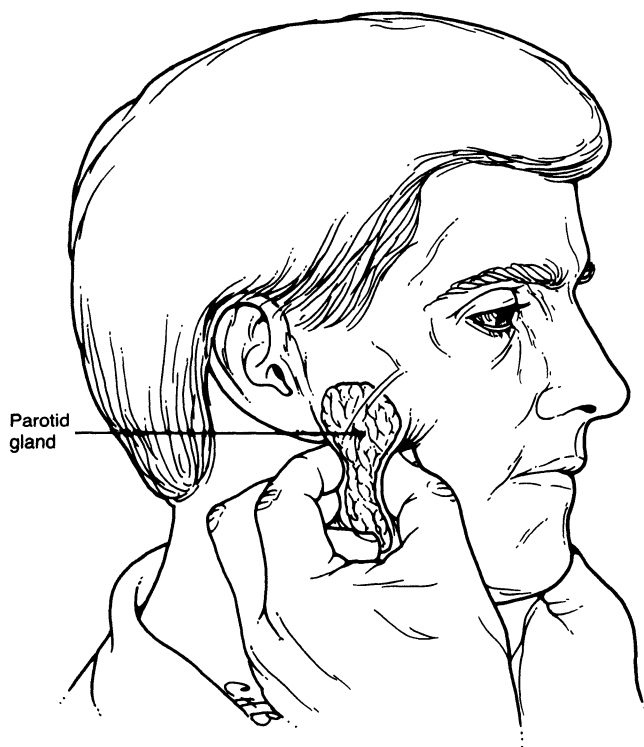


Figure 119.8
Palpation of parotid gland for enlargement, induration, tenderness or stones.

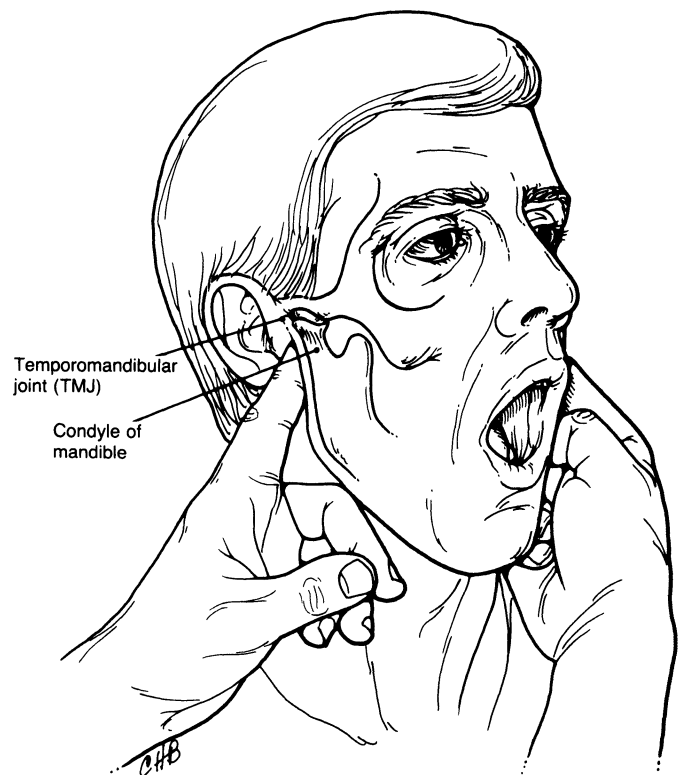


Figure 119.9
Palpation of jaw joint for tenderness or crepitance is helpful in the diagnosis of temporomandibular joint disorder.

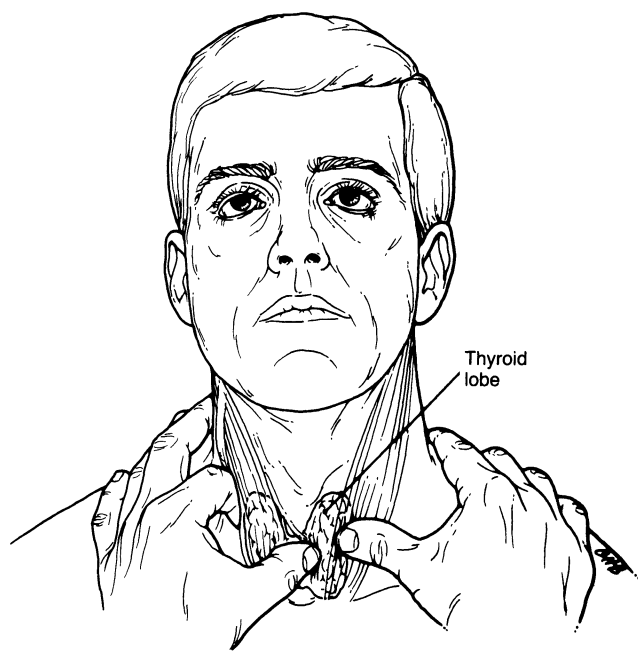


Figure 119.10
Palpation of thyroid gland from the front. Right hand displaces the gland to left of patient while left hand, index finger, and thumb palpate gland under sterno-cleido-mastoid muscle.

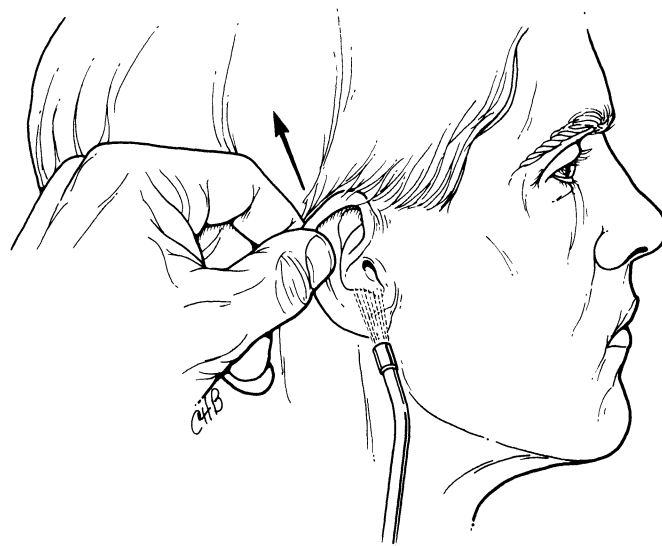


Figure 119.11
Examination of external auditory meatus. Pinna should be pulled upward and backward.

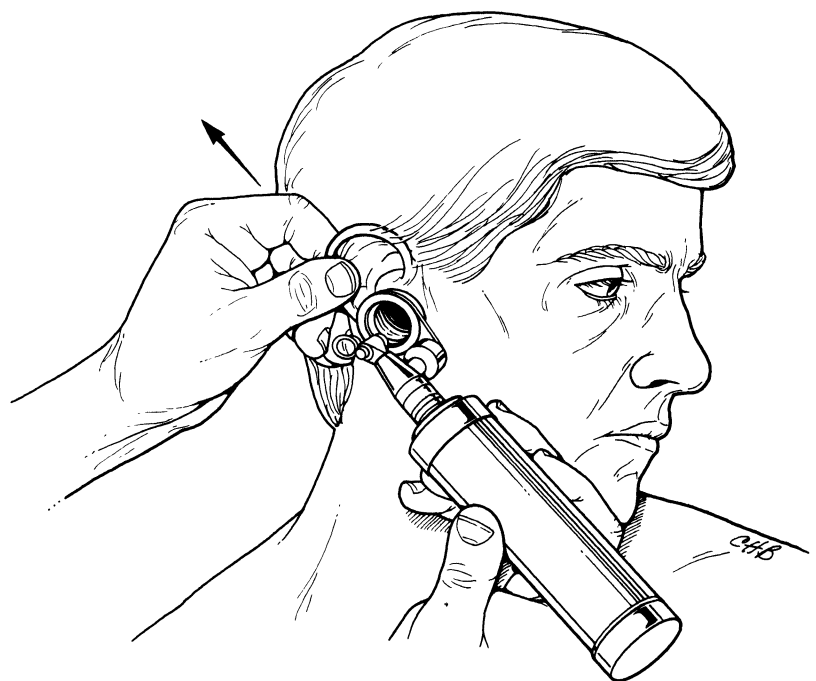


Figure 119.12
Examination of external ear canal and eardrums with otoscope. Pinna should be pulled upward and backward. Otoscope should be angled in several directions.

for any associated lymph node enlargement in the sub-mandibular or preauricular areas. The patient should be asked to perform basic facial movements, such as smiling, pursing the lips, and closing the eyes tightly, to document any asymmetry of motion or previous facial paralysis.

Ears and Hearing

Many specific and general questions are needed in order accurately to evaluate a person with a communication disorder (Chapter 126). One of the first observations to be made is the loudness of the patient's voice as he or she speaks, since many patients with conductive loss talk very softly, whereas patients with sensorineural hearing impairment talk loudly. The obvious response of the patient to the examiner's normal voice will provide clues as to the severity of hearing impairment.

Equipment needed to evaluate the ears properly consists of a wax curette with a round circular blunt end, a standard ear wax syringe, or 50 cc plastic syringe. An emesis basin to catch the water is needed also. A thin, small wire applicator with a small tuft of cotton on the end is helpful to remove secretion from the ear canal; and a battery otoscope with a pneumatic attachment for moving the eardrum inward and outward is mandatory. A penlight for inspection of the outer meatus or observation while removing wax is helpful (Figure 119.11). Standard hydrogen peroxide or aqueous zephiran is helpful to dissolve wax. A standard 256 Hz tuning fork is necessary for adequate Weber and Rinne

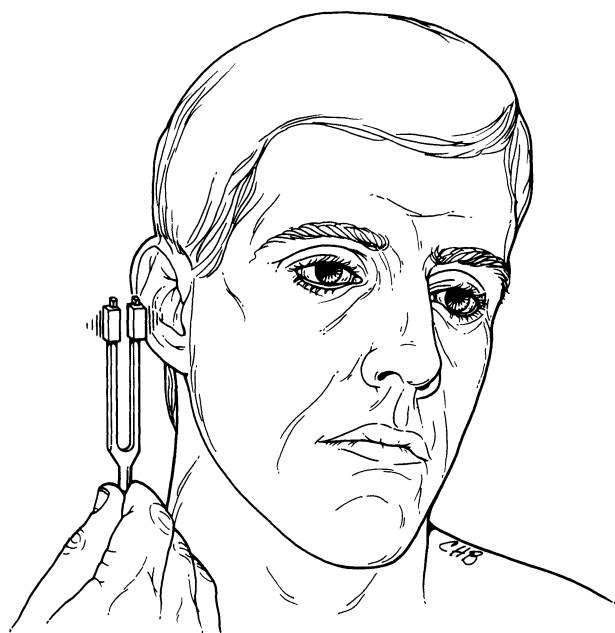


Figure 119.14

Rinne test to compare air conducted and bone conducted sound. Fork is activated and held close to the ear without touching it. Fork is then placed firmly against the mastoid bone (see Figure 119.15). Patient is asked whether sound is louder "in the ear" or "behind the ear." Normally air conduction in the ear is louder than bone conduction.

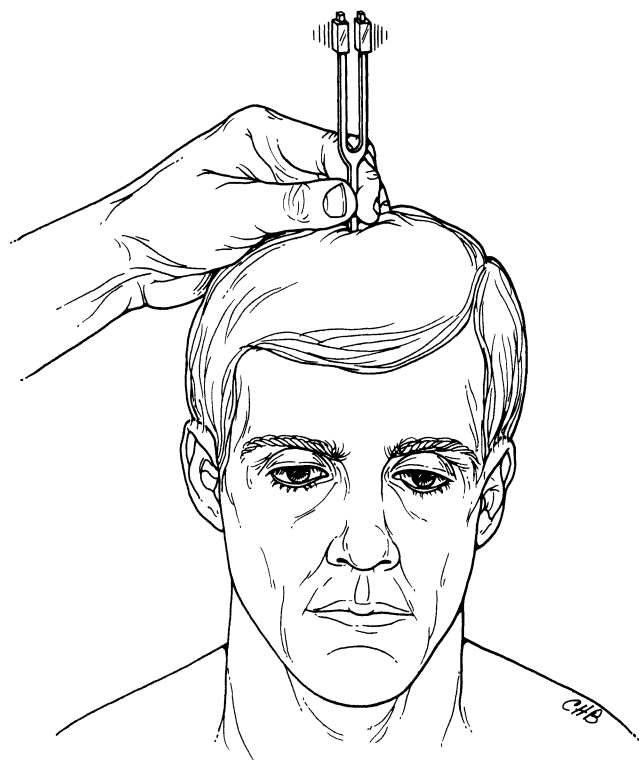


Figure 119.13

Weber test for lateralization of sound. Fork should be placed in midline of head after being set in motion. Patient should be asked if sound is heard best in right or left ear. Normally sound will not lateralize either way.

testing. The use of an electric audiometer, an impedance bridge, routine mastoid films, cultures of the ear canal, or CT scans of the temporal bone are often needed for complete evaluation.

Prior to examination, the patient should be asked about any drum perforation or previous ear surgery. If there has been none, then it is proper to irrigate the ear with a standard ear syringe. The ear canal should be inspected with a

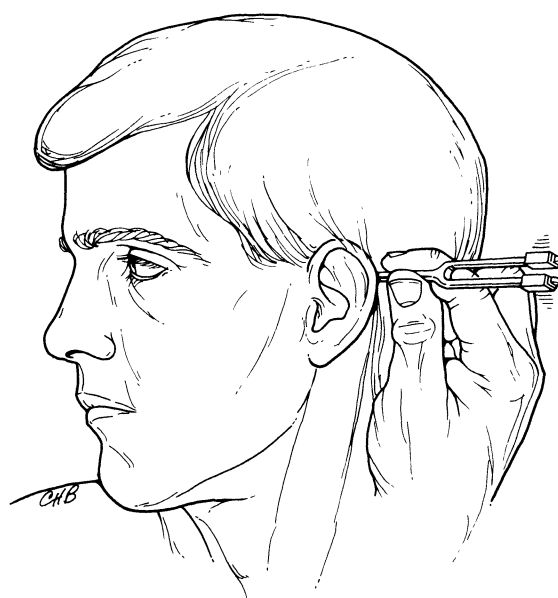


Figure 119.15

Rinne Test (see legend under Figure 119.14).

penlight, and the pinna should be moved to discern any possible tenderness. If the canal appears clear, the otoscope should be used to examine the canal and the eardrum carefully with pneumatic pressure applied (Figure 119.12). The Weber and Rinne test should be performed in a quiet area and recorded (Figures 119.13–119.15). Air conduction with a tuning fork should be compared between ears to note any difference. The patient's response to normal conversation when facing the examiner and with the face turned away

should be noted. All secretions from the ear should be cultured. The eyes should be checked for nystagmus in all gazes and at the time of pressure with the pneumatic otoscope to document the possibility of nystagmus created by ear pressure movement. Romberg and tandem gait tests should be performed on patients who have any complaints of vertigo (Chapter 127). It is also helpful to carry out standard Hallpike maneuvers to determine positional nystagmus.